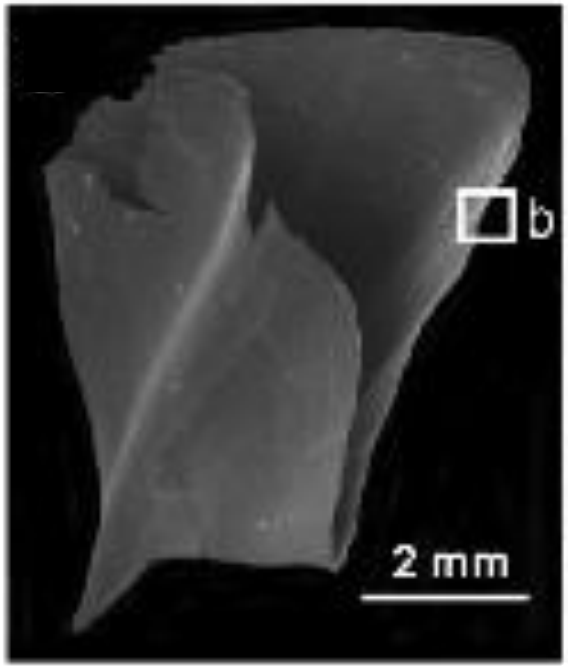
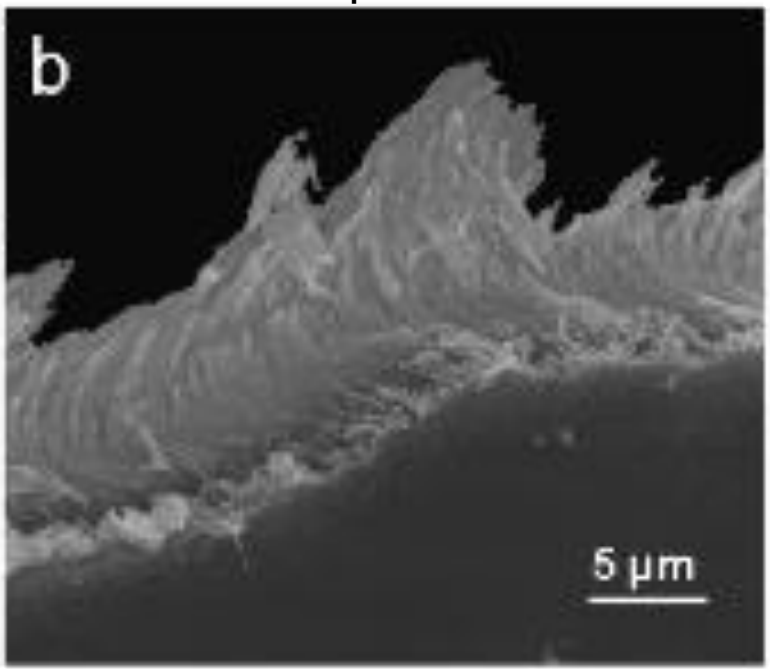
Biological response

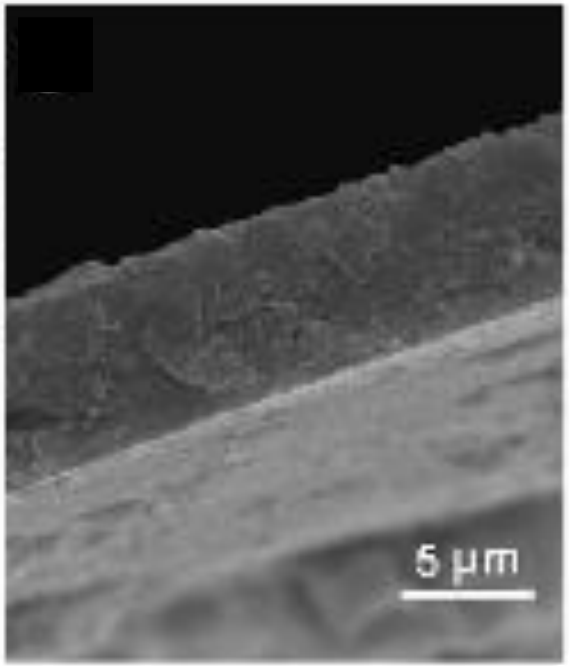
Pteropod shell



Whole shell at low pH



Shell margin at low pH

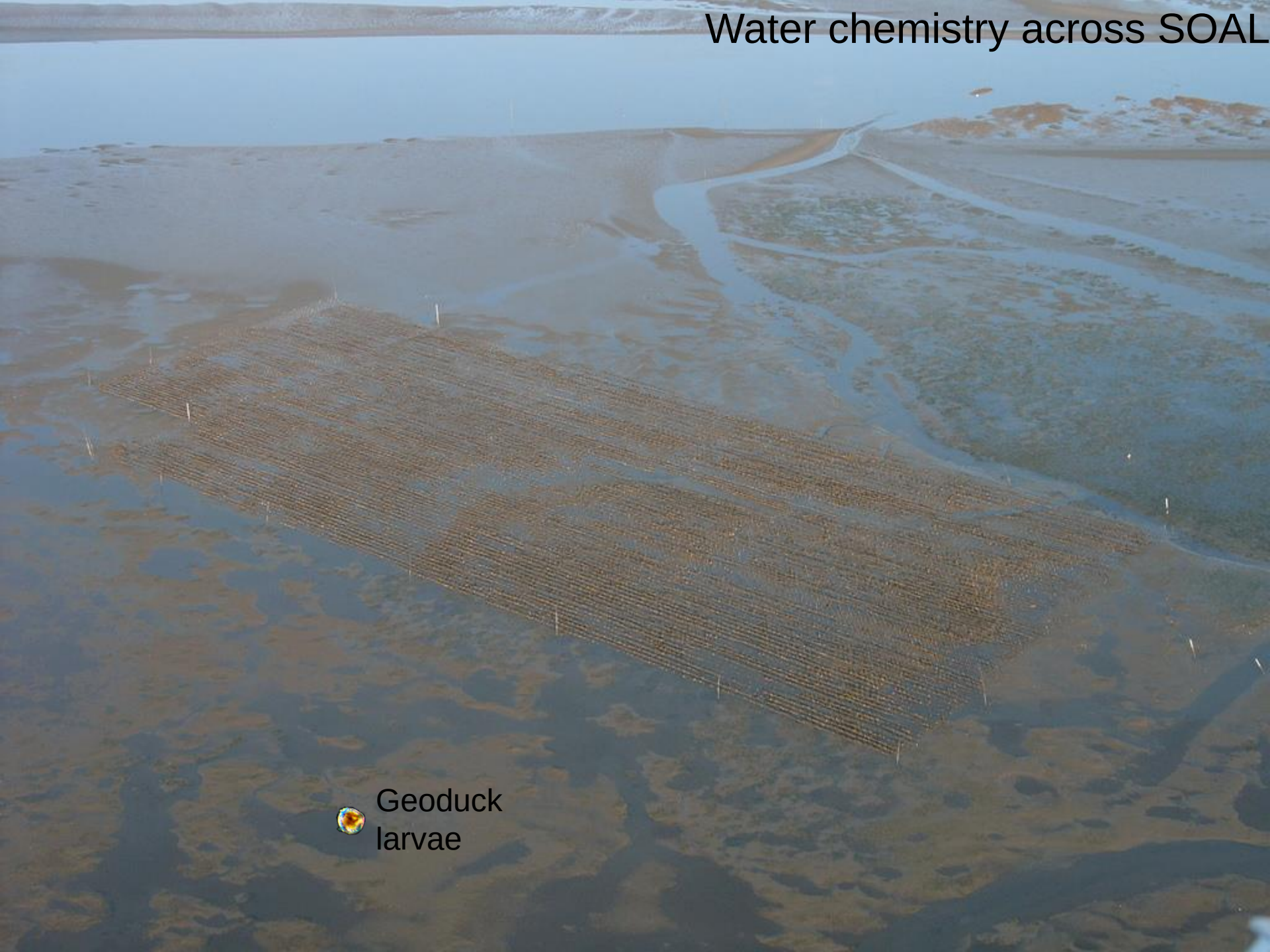


Shell margin at high pH

- Lower pH reduces shell deposition rate and increases dissolution of deposited shell.

Fabry et al. 2008

Water chemistry across SOAL



Water chemistry across SOAL

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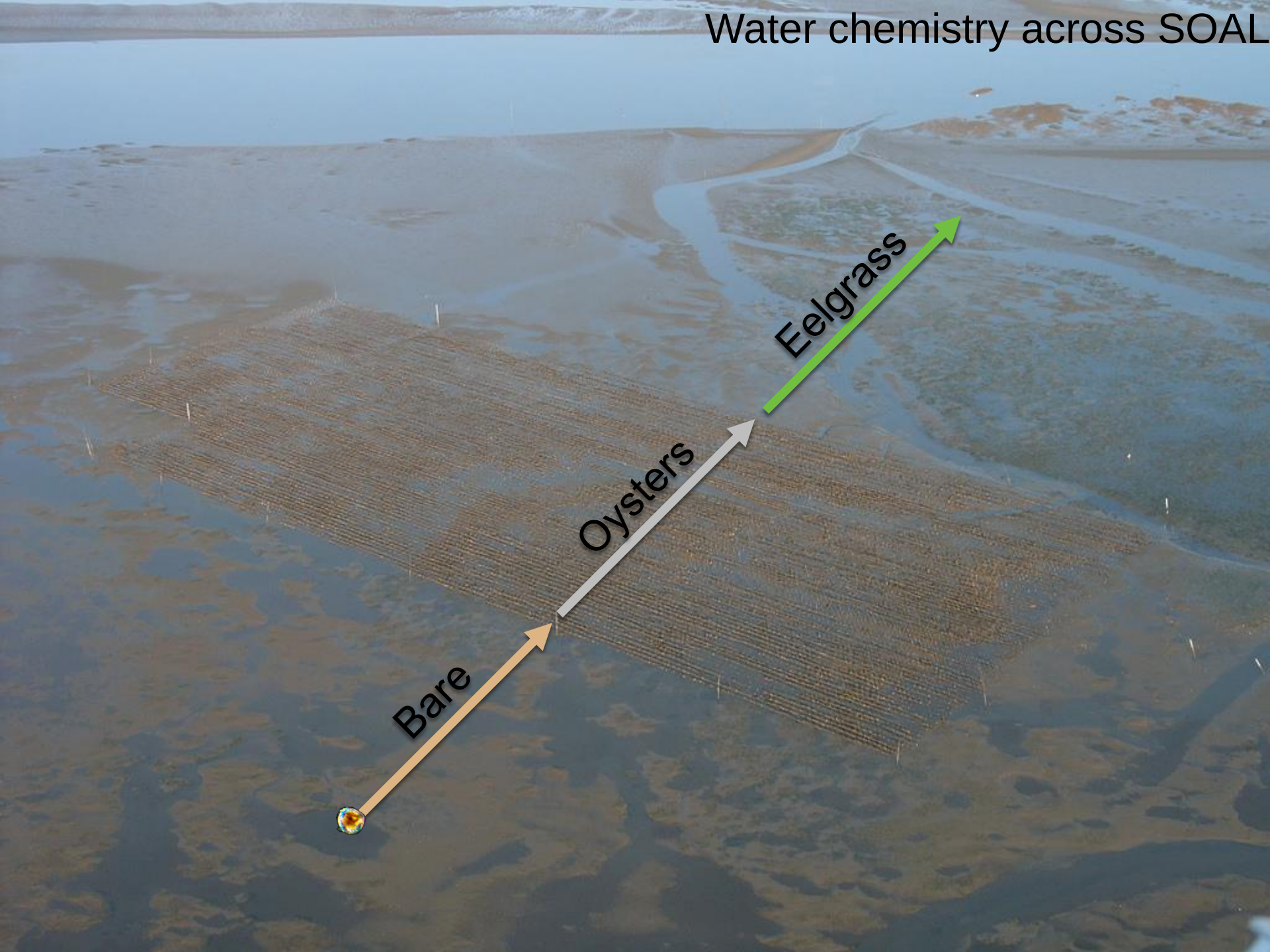
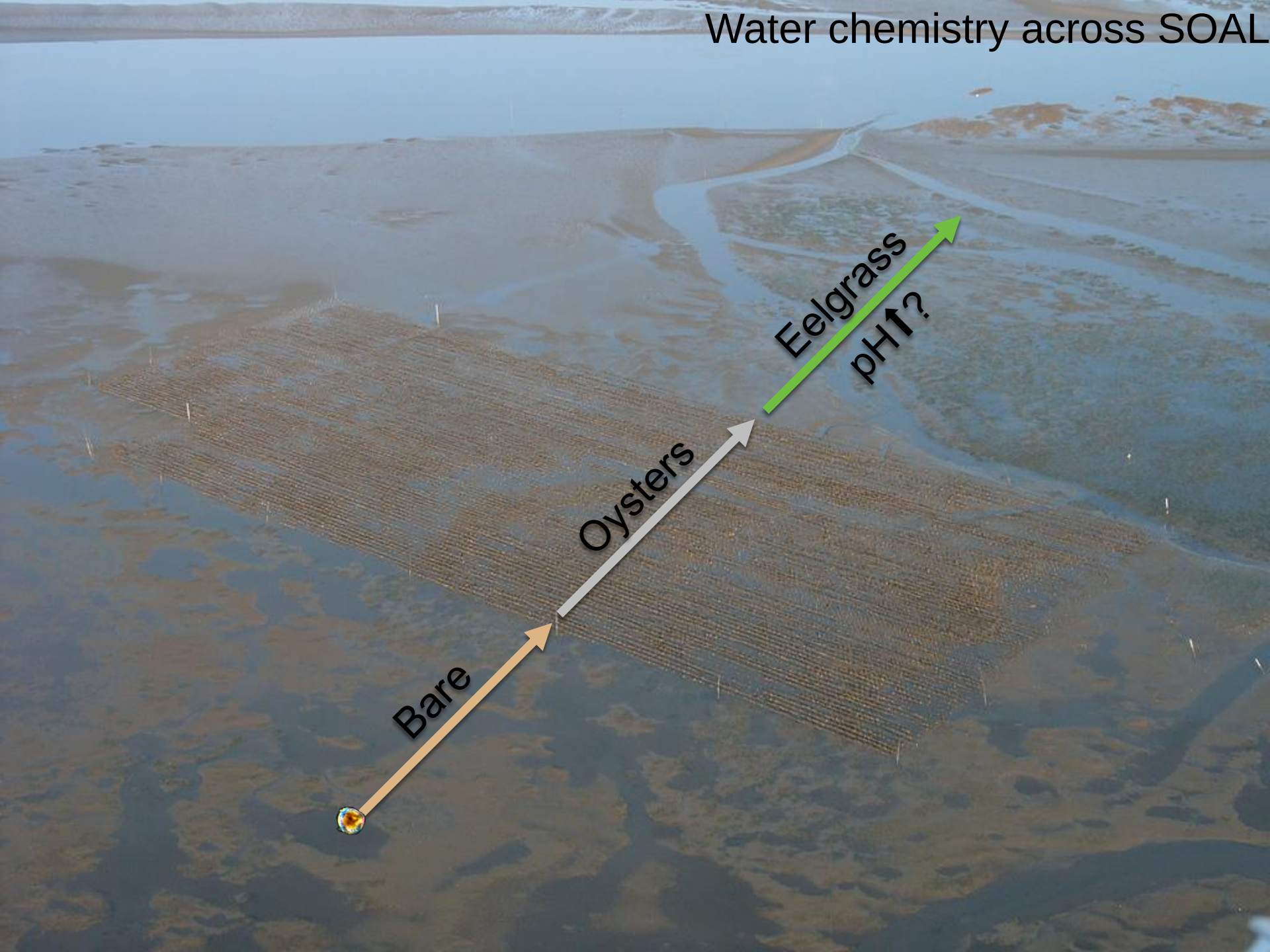
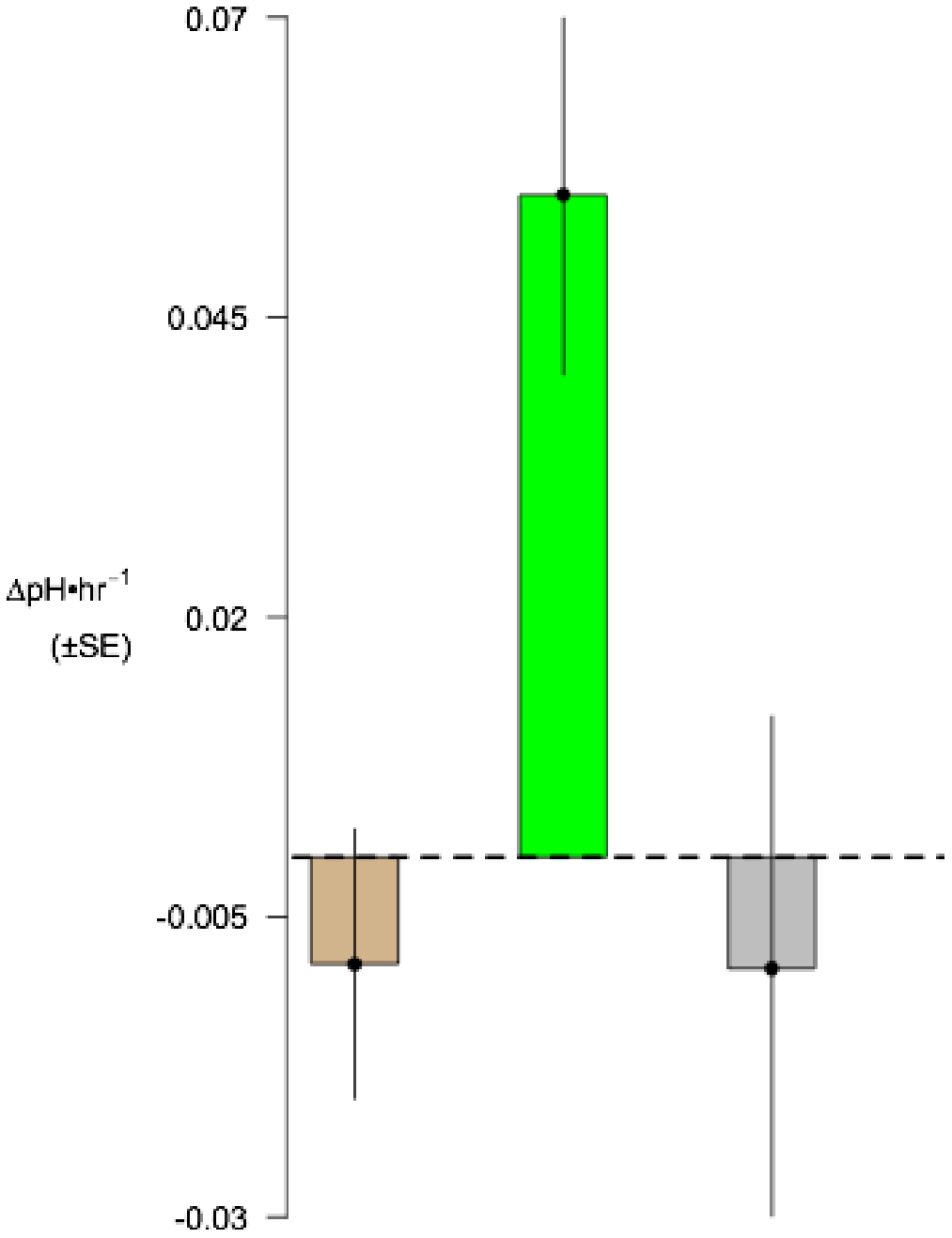



Water chemistry across SOAL
Bare
Oysters
Eelgrass
pH⬆?

Water chemistry across SOAL

Water chemistry across SOAL

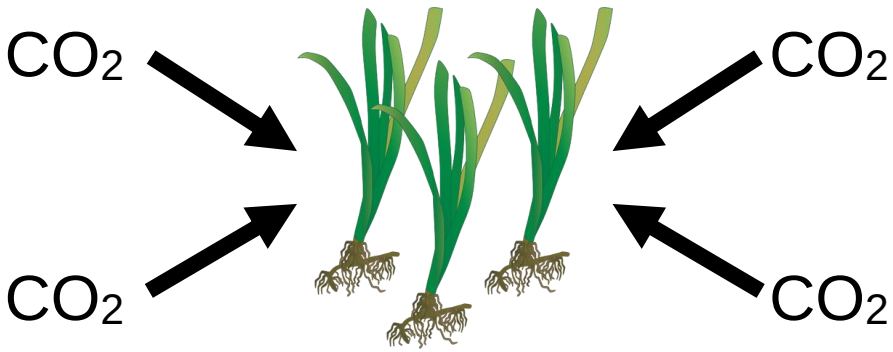


Habitats

- Bare
- Eelgrass
- Oysters

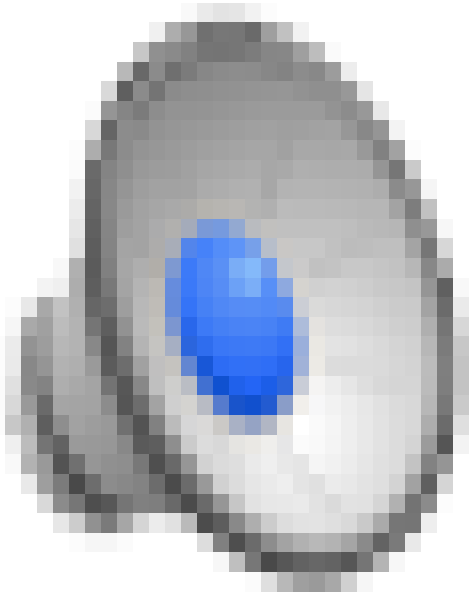
- Eelgrass increases pH, presumably through photosynthetic drawdown of CO_2

- AAMT research shows that eelgrass absorbs CO_2 and increases pH.



Hypothesis: Larvae exploit ⬆pH in eelgrass

OA refugia



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OA refugia

Daytime larvae

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Daytime larvae

Deep > shallow in grass

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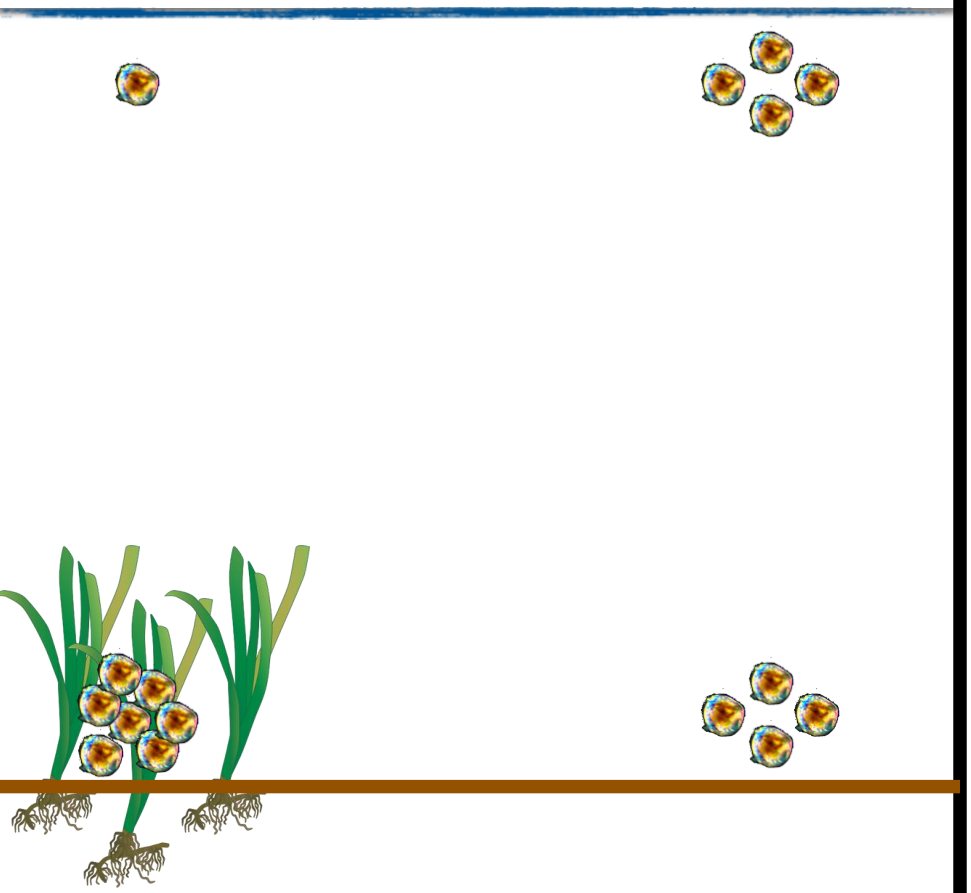

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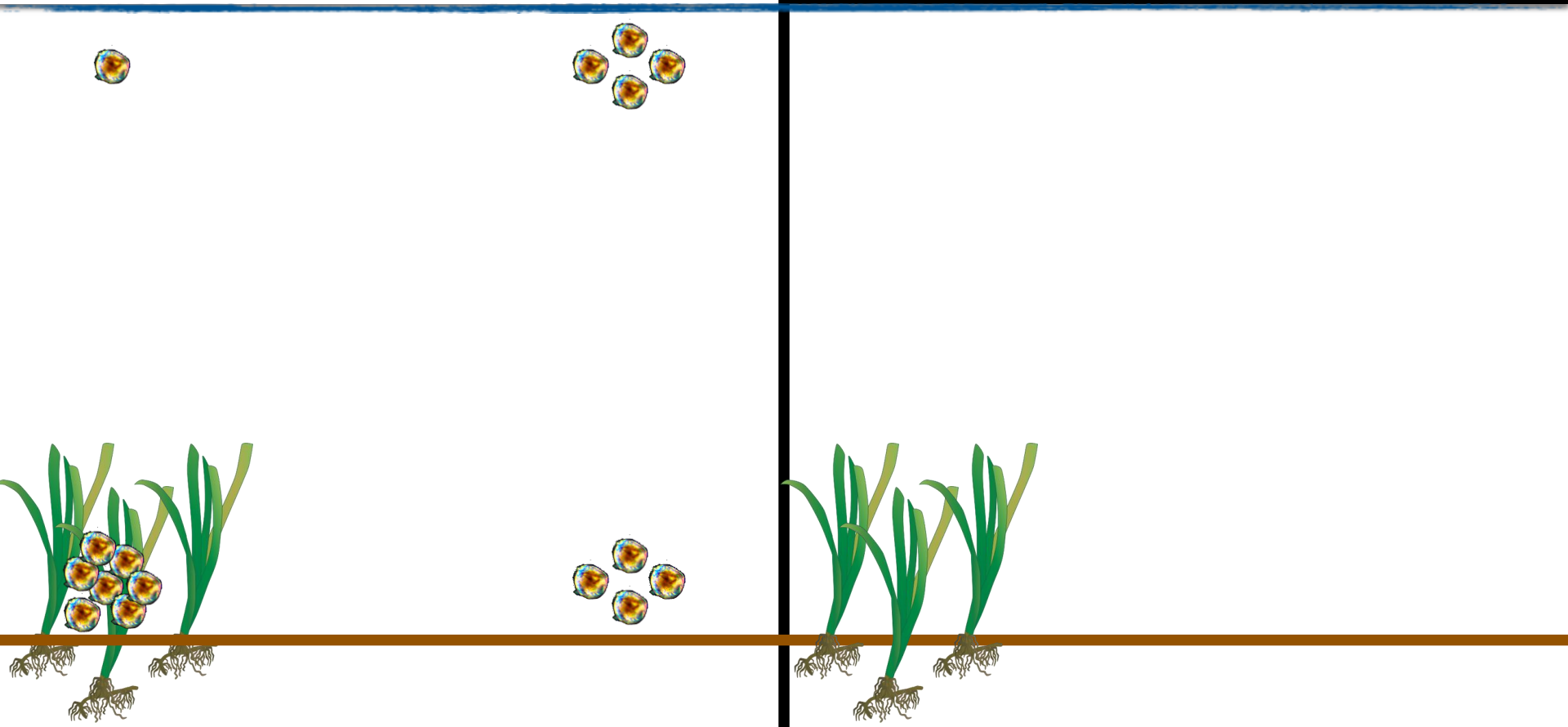

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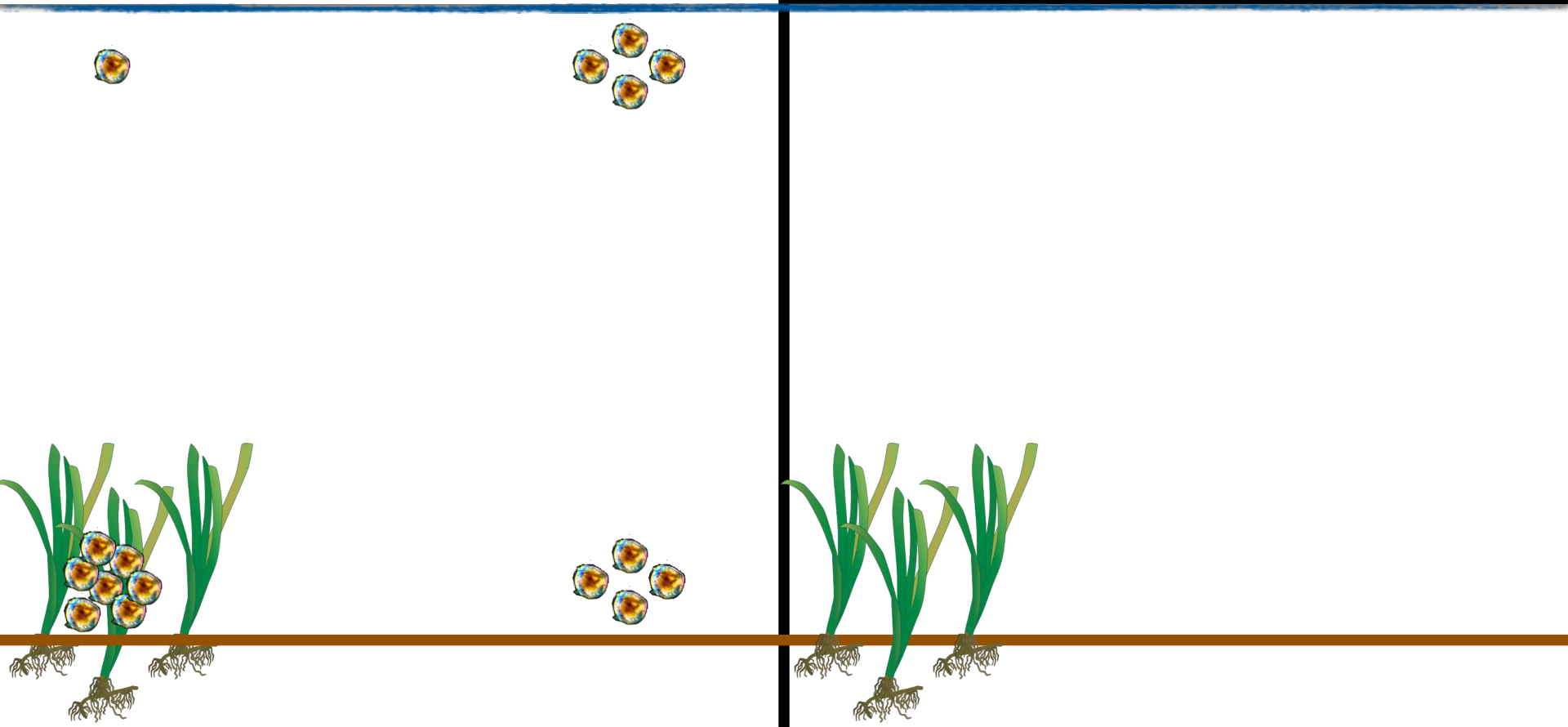

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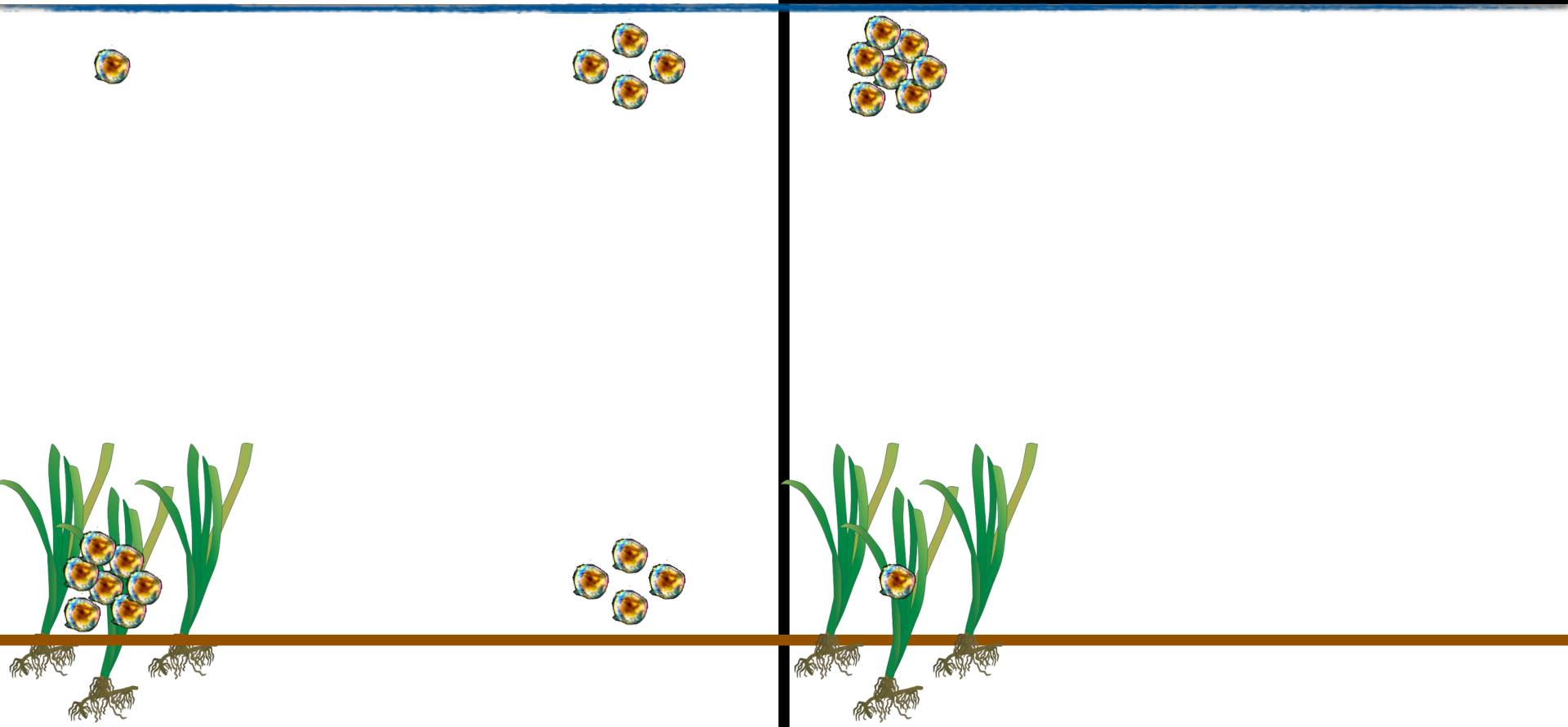

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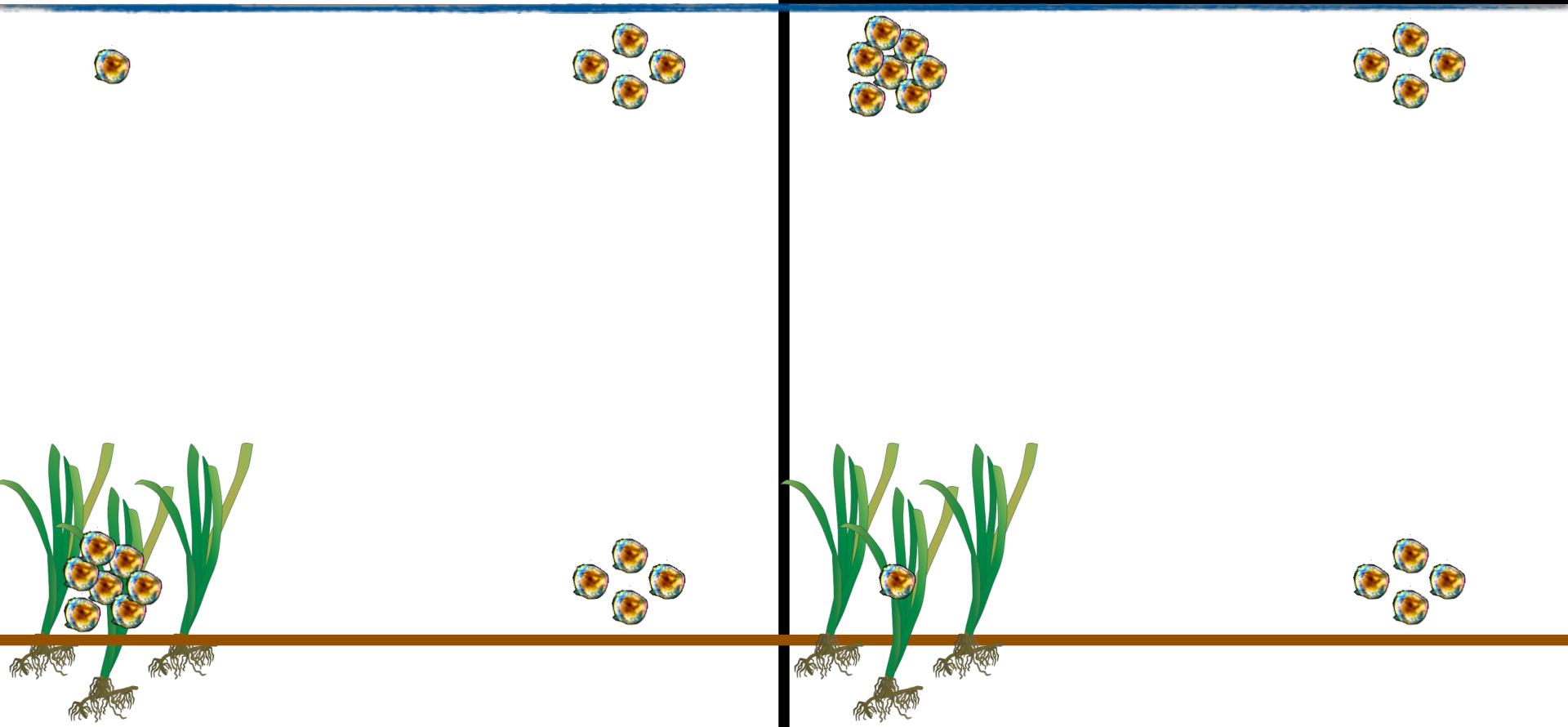

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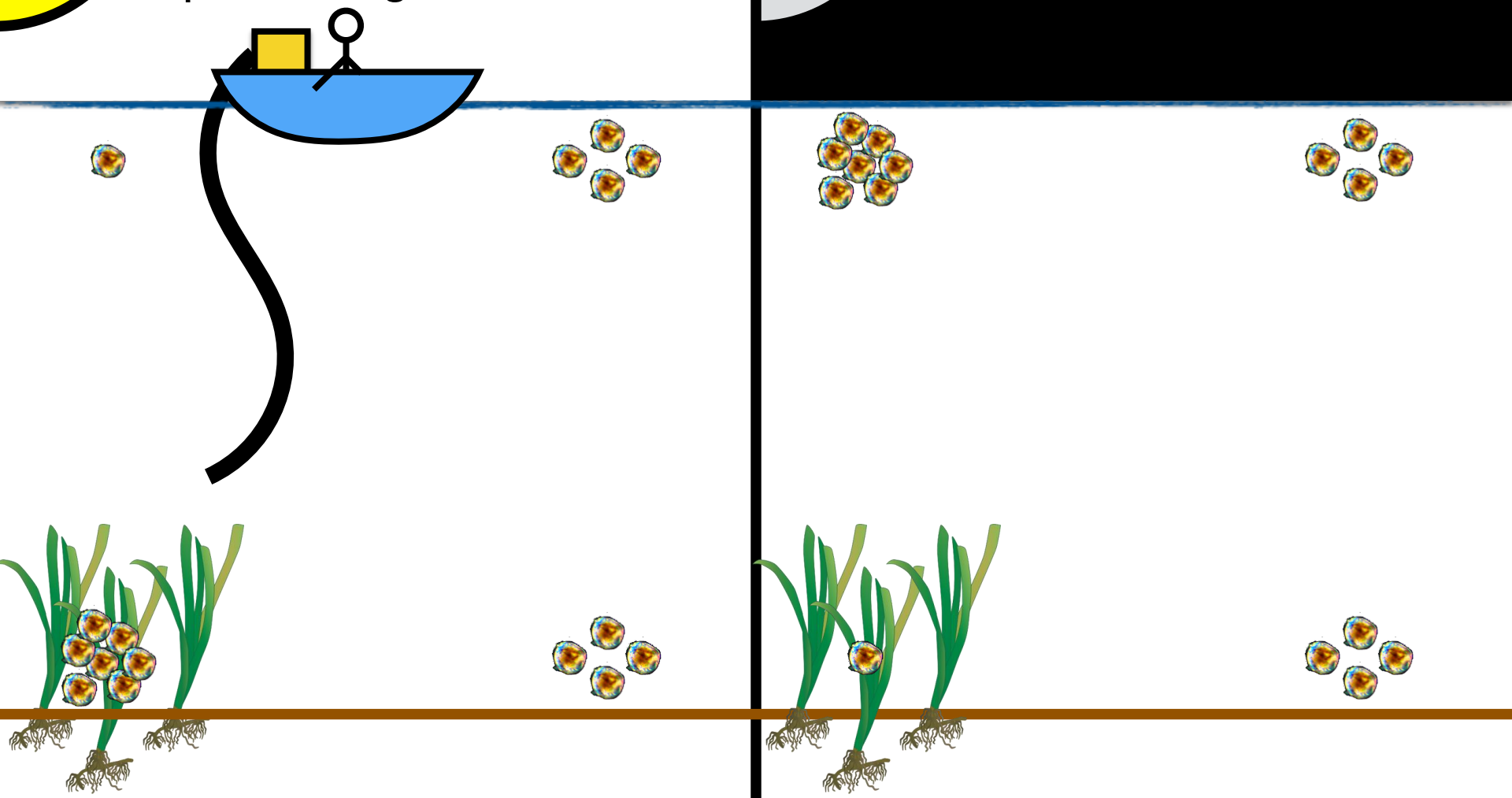

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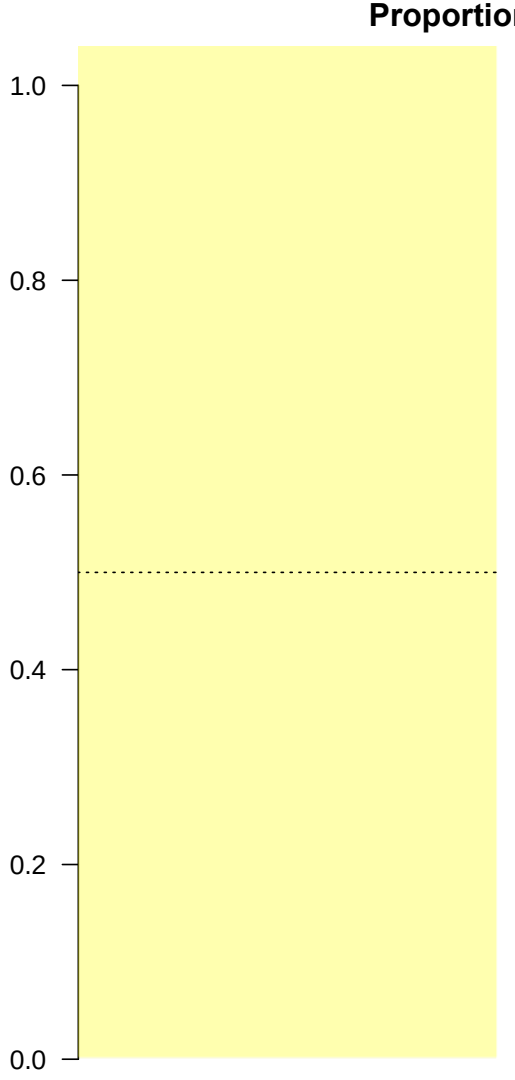

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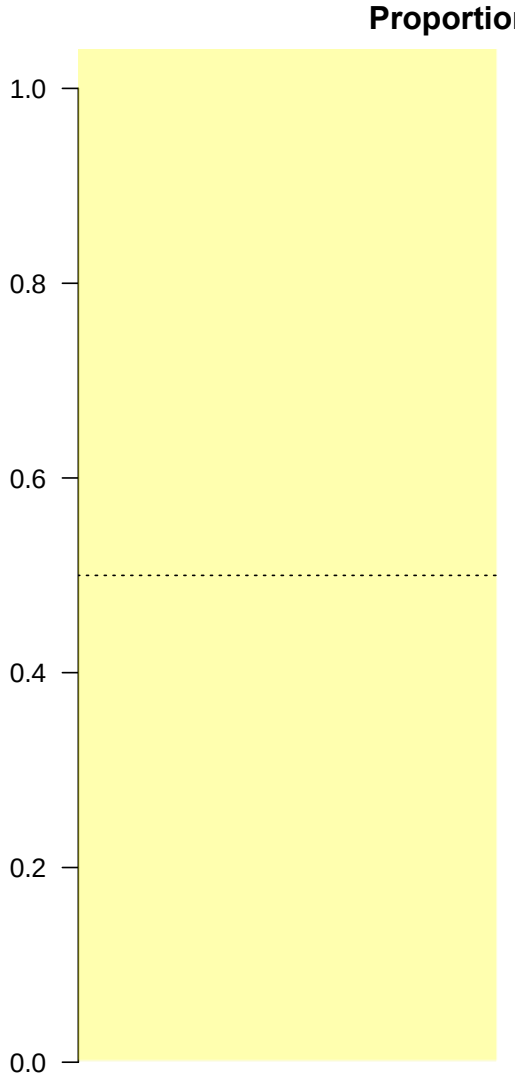

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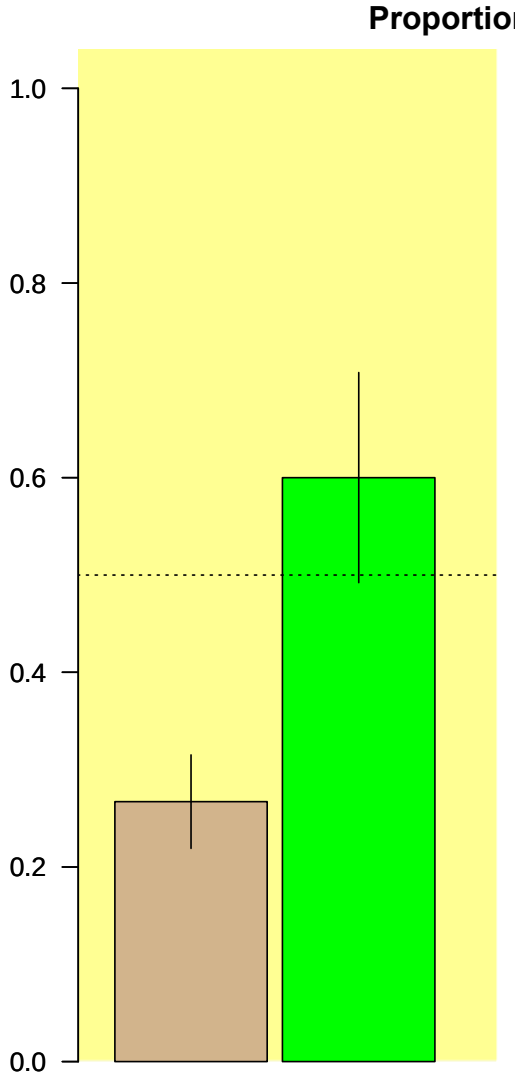

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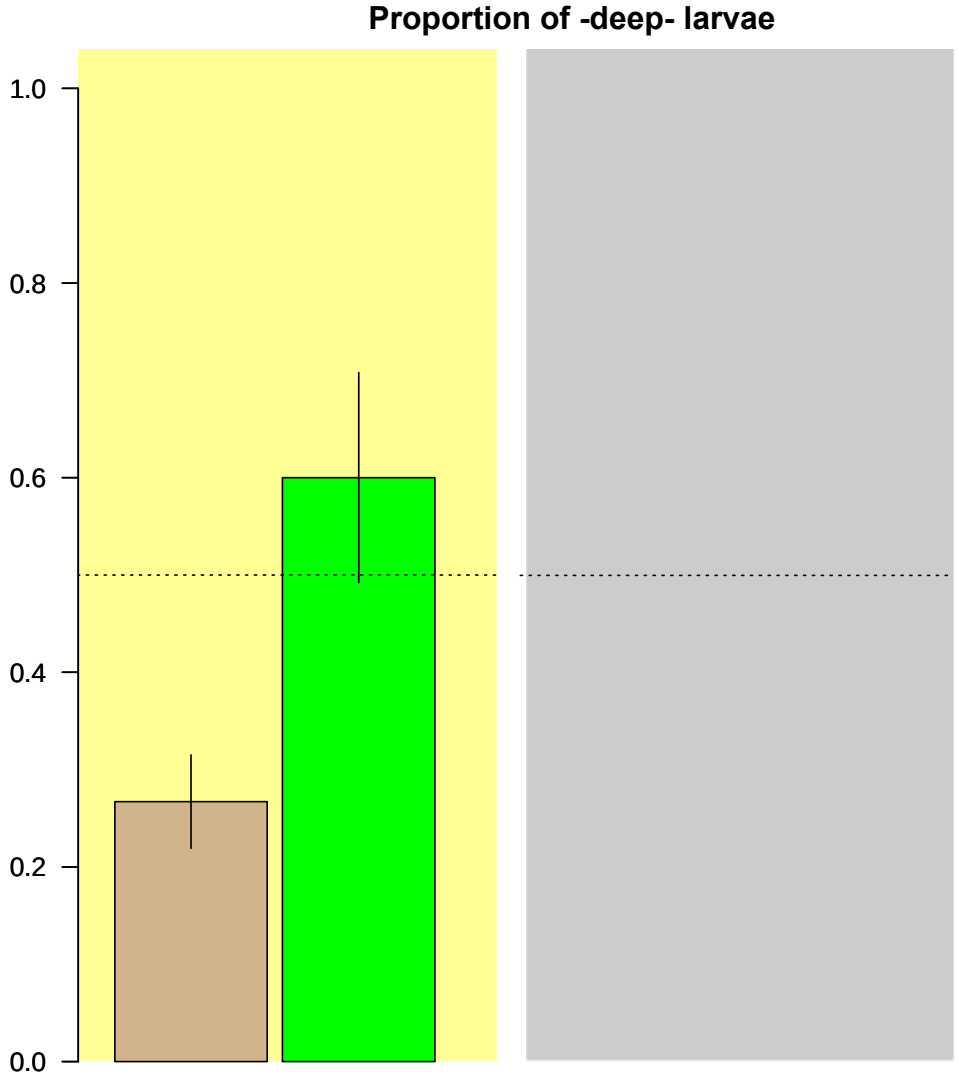

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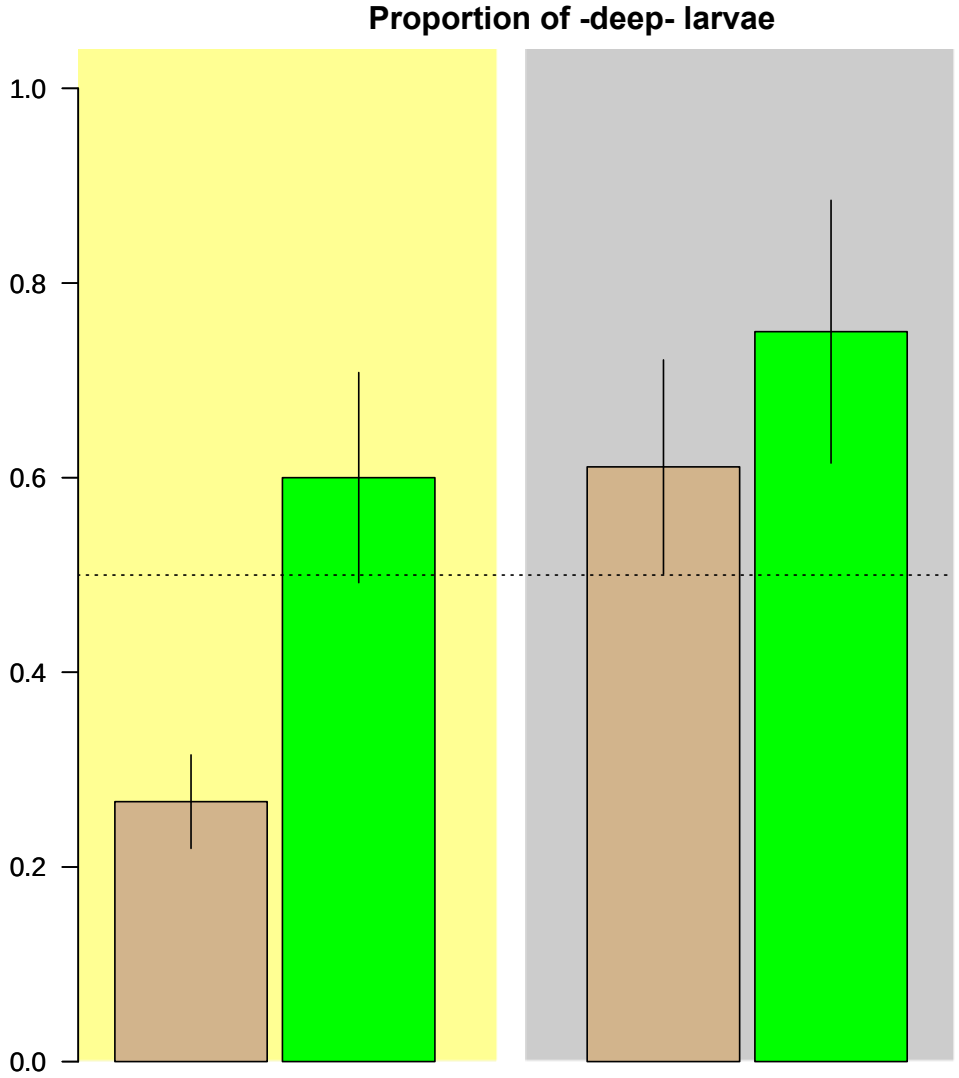

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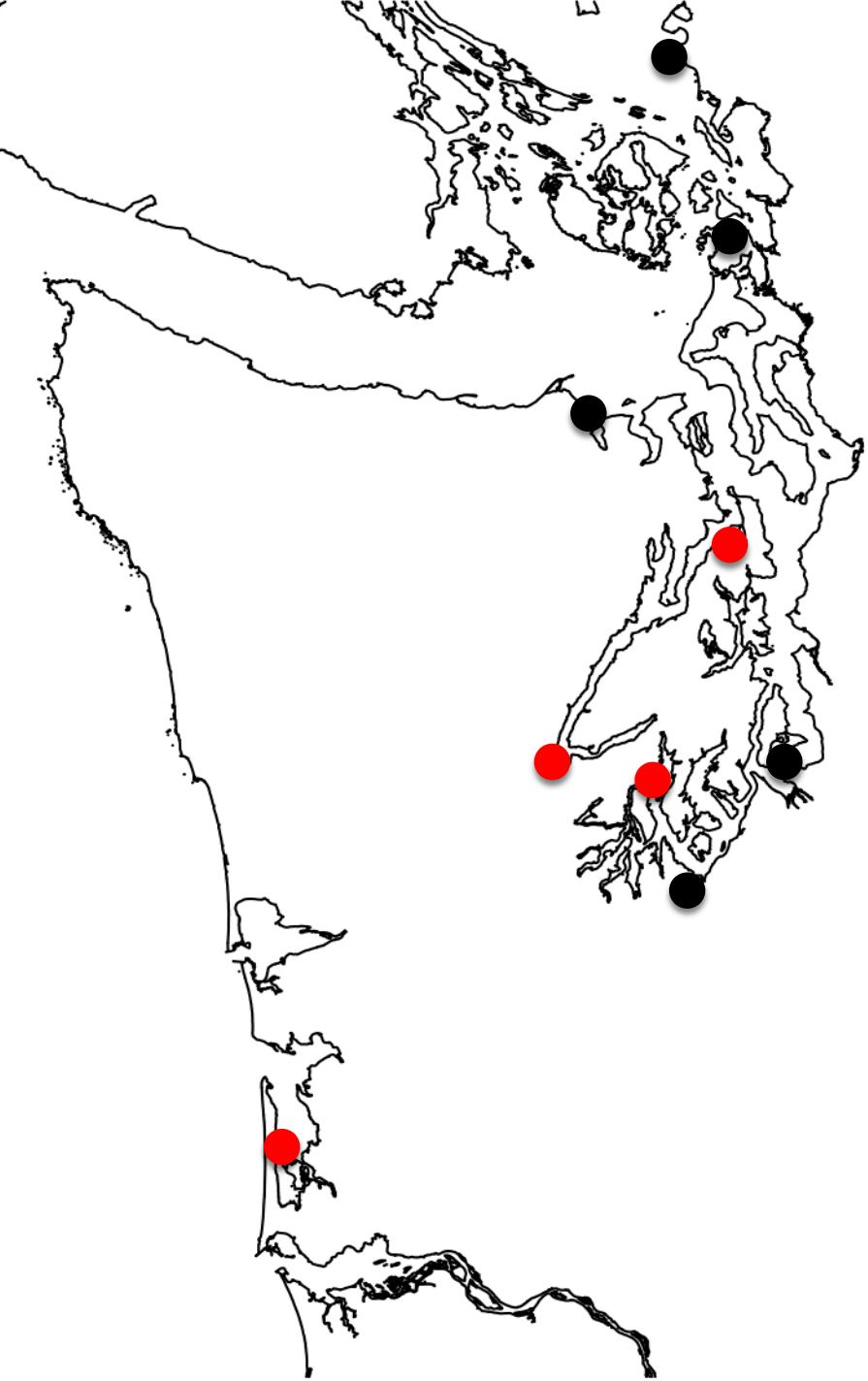


Nearshore monitoring network

Sites

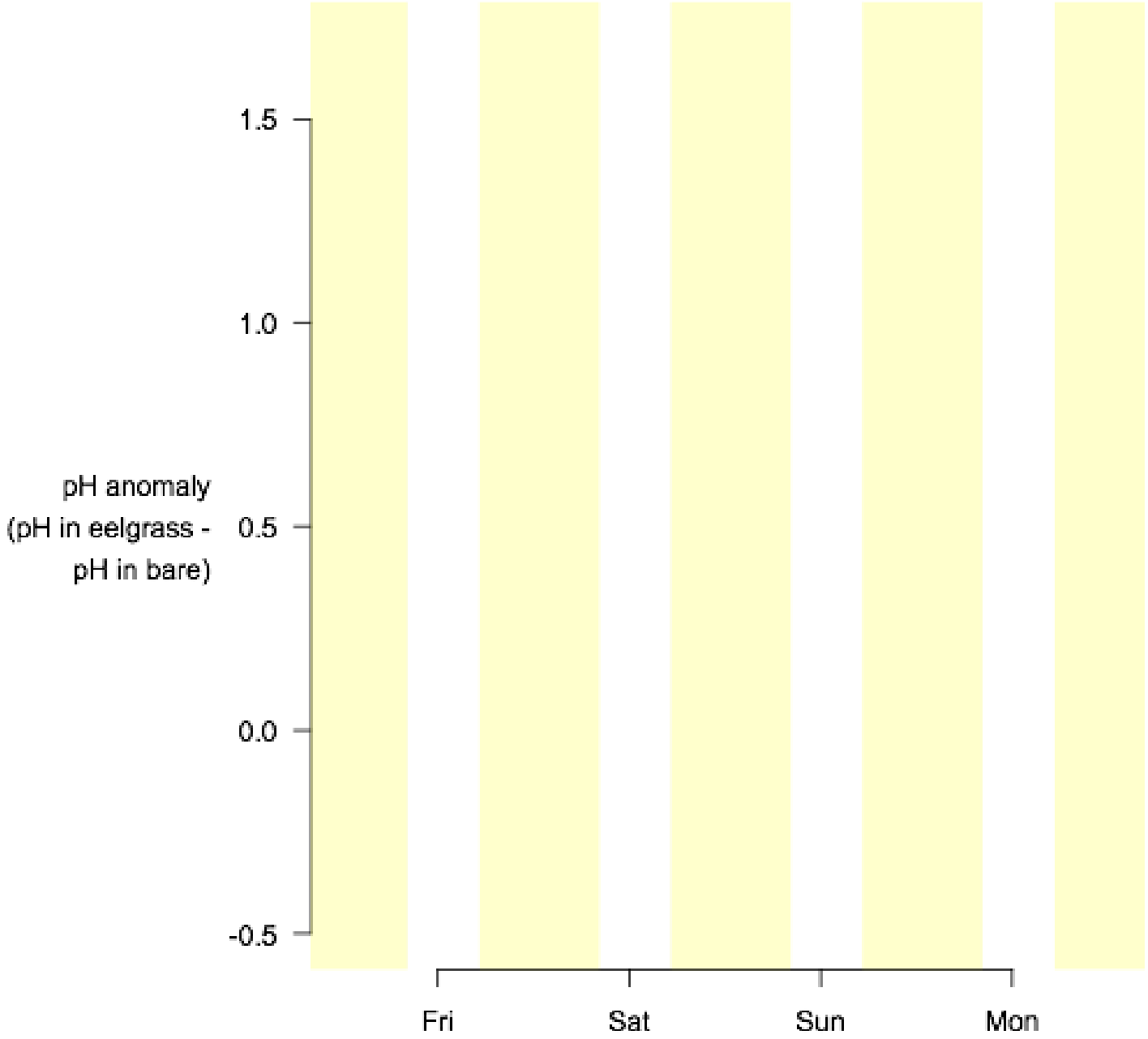
Cherry Point
Fidalgo Bay
Protection Island
Maury Island
Nisqually Reach
- Skokomish Delta
- Port Gamble Bay
- Case Inlet
- Willapa Bay

Sensors

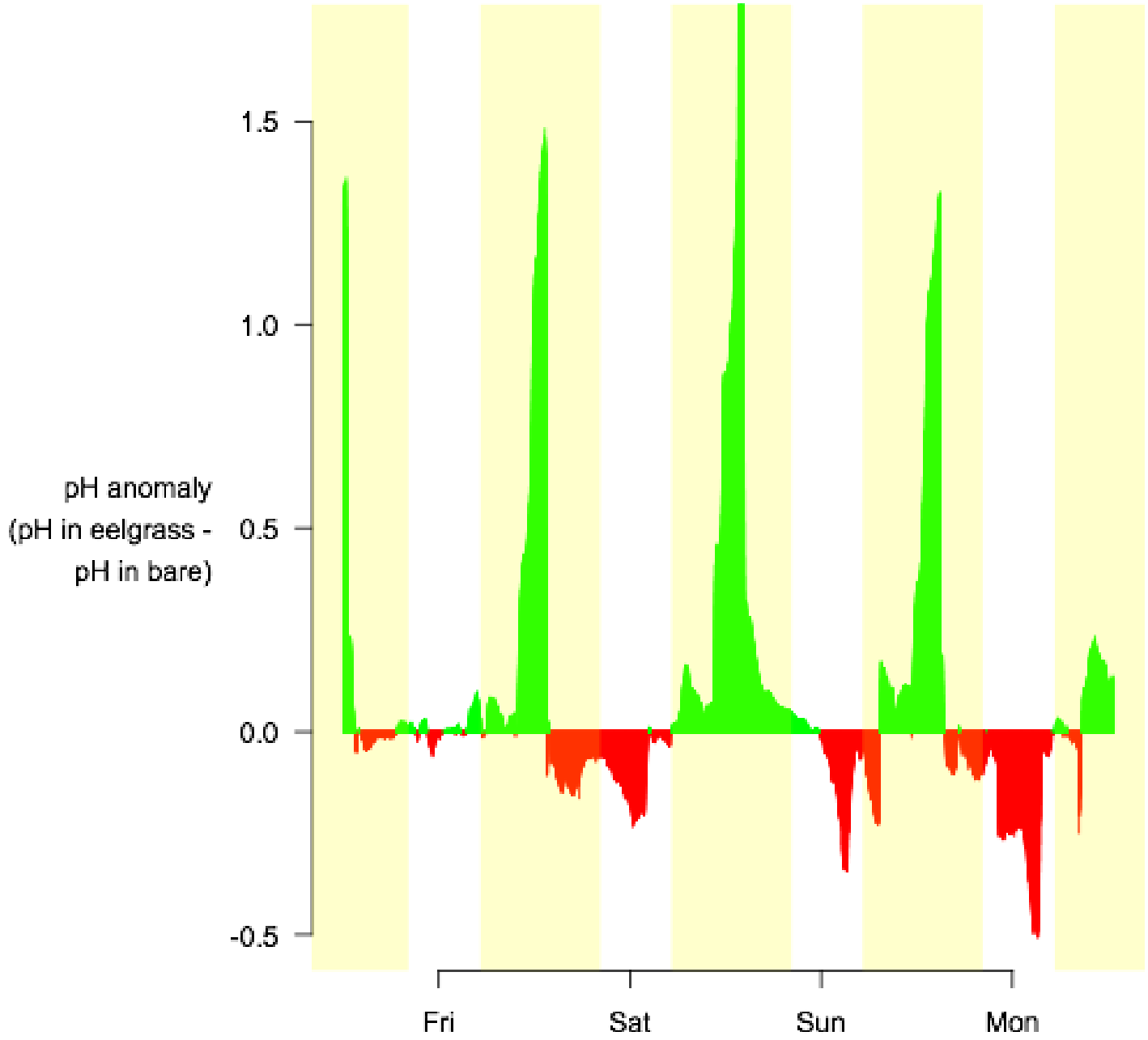
pH
Temperature
Salinity
Dissolved oxygen
Chlorophyll

Nearshore monitoring network

Nearshore monitoring network

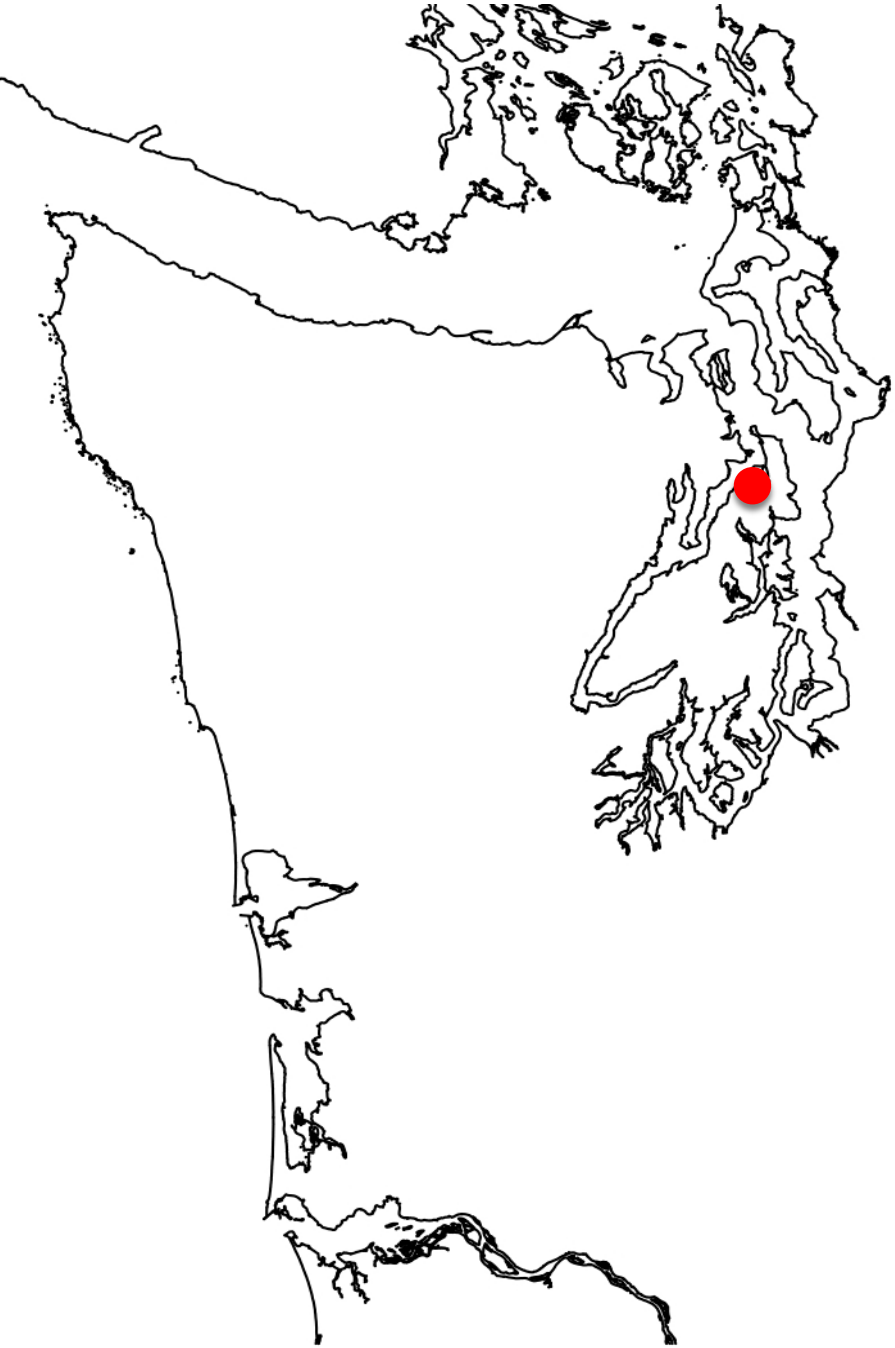


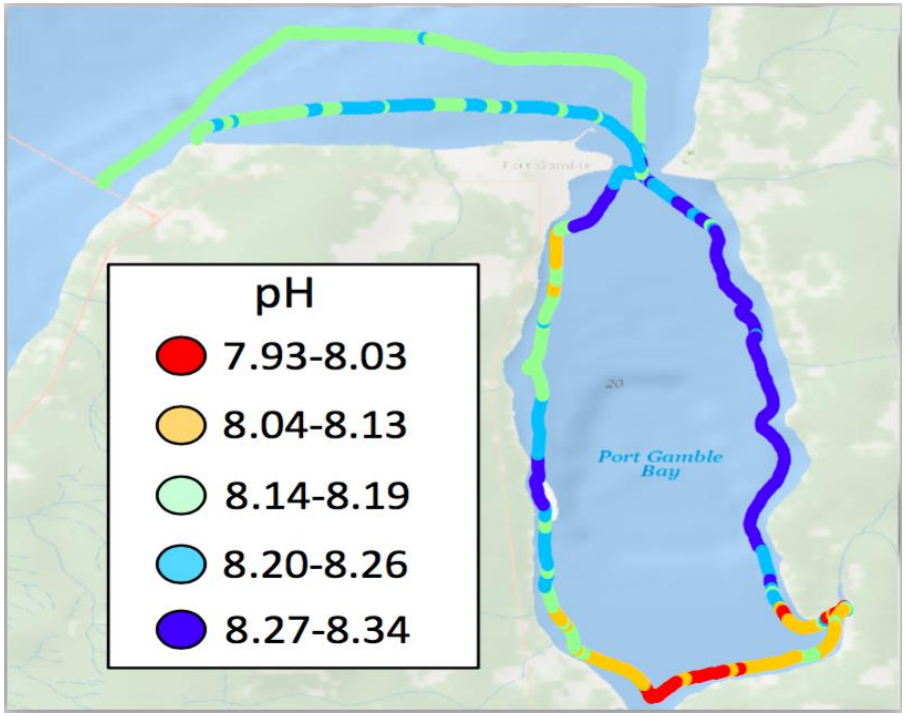
Nearshore monitoring network



- Sensor arrays will help us evaluate variation in water chemistry across time.

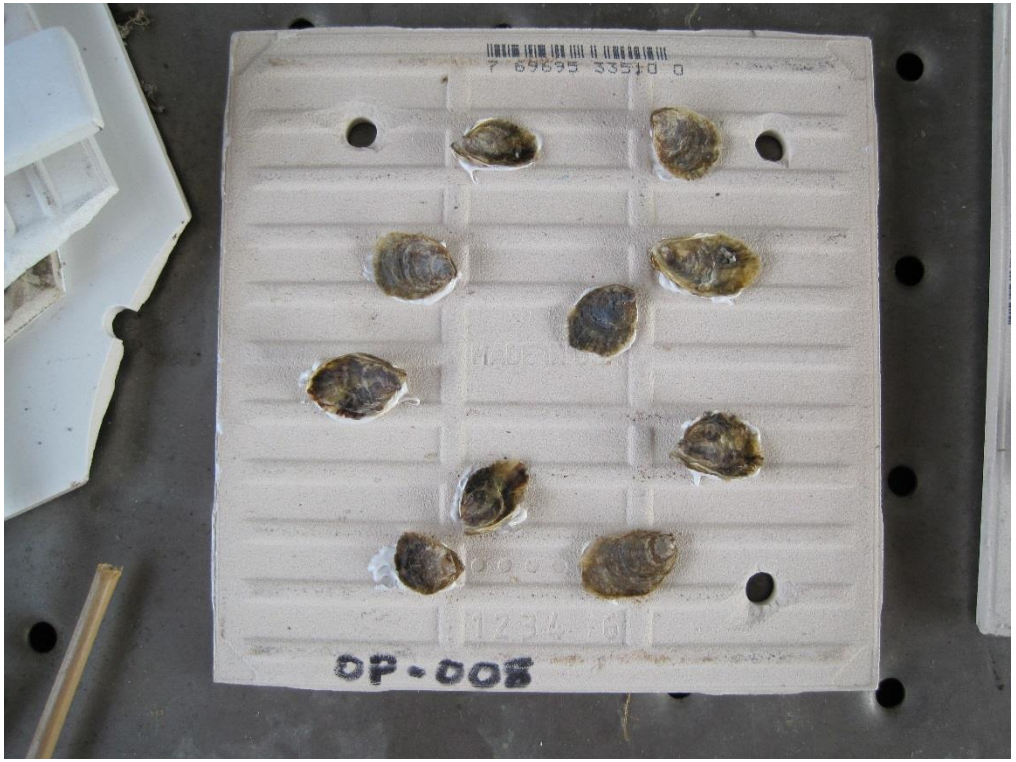
Nearshore monitoring network





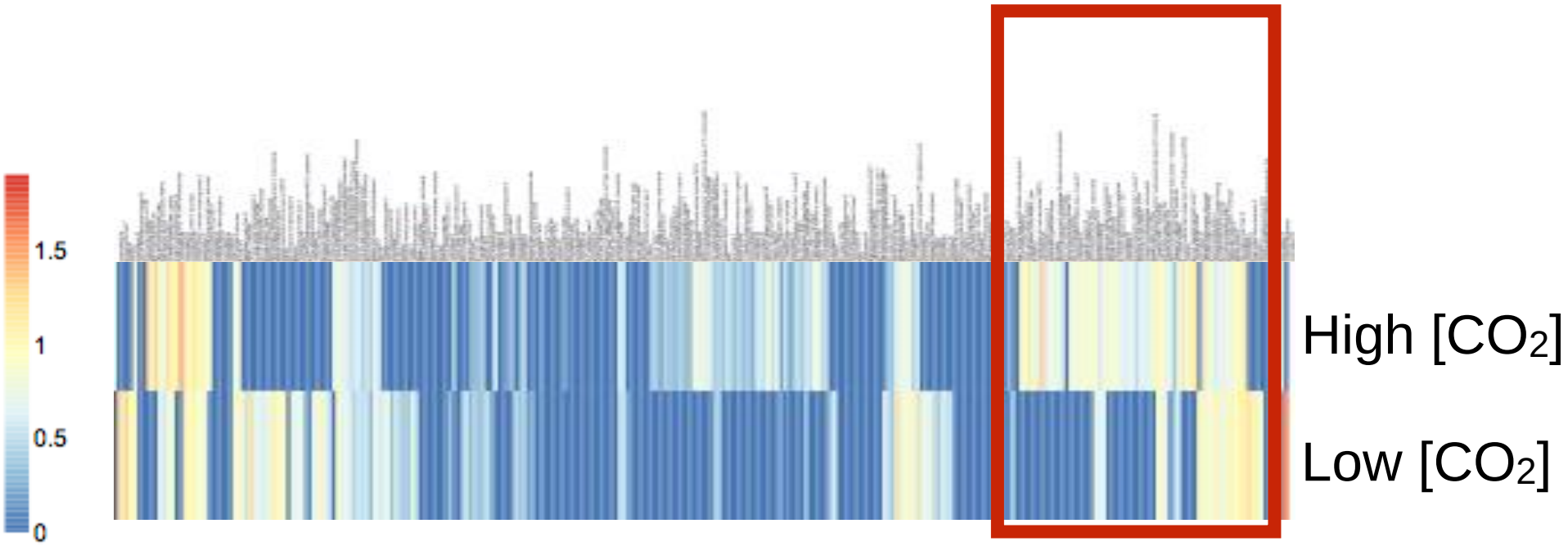
- Mapping expeditions at network sites will help us evaluate variation in water chemistry across spatial scales.

Nearshore monitoring network



- ‘Bioassays’ - outplanted oysters on buffered and unbuffered tiles – could let us identify network sites subject to OA stress.

Nearshore monitoring network



- Analysis of larvae will help us pinpoint populations and areas of concern – oyster larvae express different proteins under OA stress.

Timmins-Schiffman et al. 2014